



LIFE INSURANCE AS A SOCIAL CATALYST

THE SOCIOECONOMIC EFFECTS OF LIFE INSURANCE PAYMENTS
TO BENEFICIARIES IN THE UNITED STATES

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EXECUTIVE SUMMARY

Life insurance has long served as a crucial financial safety net for families and households experiencing the loss of a loved one. In the US, this importance is growing: in 2016, the life insurance industry paid out over \$100 billion to beneficiaries—more than twice as much as in 2001.¹



\$100 bn

**In life insurance death
benefit payments in
2016**

*Represents more than
a 100% increase in life
insurance payouts between
2001 and 2016*

These death benefit payments (“payouts”) to beneficiaries often provide a vital lifeline at a difficult time: helping to make up for lost income so non-discretionary items such as rent/mortgages and childcare costs can continue to be paid; protecting savings from being depleted; paying off debts; or covering the estate taxes that arise when someone dies. This is important given that, on average, many Americans struggle to provide for their basic needs on a regular basis – 63 percent of workers say it would be very or somewhat difficult to meet their current financial obligations if their next paycheck were delayed for a week.²

But beyond this, life insurance plays a wider role—helping to protect and boost the health of the US economy by providing societal benefits in a number of areas. The econometric analysis in this report, conducted by Oxford Economics with support from Prudential Financial, adds a new statistical modeling dimension to the knowledge base around these benefits.

Our research focuses on three socioeconomic effects where analysis has identified statistically significant relationships between life insurance payouts and societal value. In short, life insurance payouts:

- lower poverty levels;
- reduce unemployment rates; and
- increase house prices.

This study looks at each of these relationships in turn, and quantifies the scale of their impact in socioeconomic terms. Our findings suggest that as the monetary levels of life insurance payouts continue to rise, the positive implications both for public savings and wider societal value deserve broader recognition.

¹ ACLI. (2017). 2017 Life Insurers Fact Book.

² American Payroll Association, “Getting Paid in America” survey, 2016.



\$1.74 bn

Taxpayer savings
in federal spending
on poverty from a
hypothetical 5%
increase in life
insurance payouts in
2016

*Largest benefits accrue to
states with largest poverty
numbers—California, New
York, and Florida*



\$609 mn

Decrease in taxpayer
spending associated
with supporting
unemployment if 2016
life insurance payouts
hypothetically increased
5 percent

LIFE INSURANCE PAYOUTS AND POVERTY

Life insurance payouts help to protect household incomes and to keep people employed. When a primary income earner passes away, for example, payouts may provide enough of a cushion to help lift a family out of poverty, or prevent a family from entering into poverty altogether.

The relationship between life insurance payouts and poverty is inverse, meaning that increases in life insurance payouts drive reductions in poverty. Our modeling shows that a hypothetical five percent increase in 2016 life insurance payouts would cause a 0.033 percentage point reduction in poverty.³

Scaled up, this reduction in poverty would positively affect approximately 108,100 people in the US—equating to a public saving of \$1.74 billion from federal social welfare programs. Stated differently, a \$1 increase in life insurance payouts may help save taxpayers \$0.35 in terms of this socioeconomic effect alone. *Furthermore, this only accounts for federal public savings, and does not factor in savings to state-level poverty programs.*

LIFE INSURANCE PAYOUTS AND UNEMPLOYMENT

The second variable identified as having a causal relationship with life insurance payouts is unemployment. At first, this might seem curious: why would an increase in life insurance payouts reduce unemployment? But the research identifies a host of ways in which life insurance acts to stabilize businesses and minimize disruptions in the face of adverse circumstances, allowing them to continue to operate and thus safeguarding jobs.⁴

So the potential economic benefit of a hypothetical five percent increase in life insurance payouts can be expressed in terms of the knock-on savings to taxpayers from decreases in demand for federal government programs that support the unemployed.

We calculate that such an increase in 2016 payouts would cause a 0.084 percentage point reduction in the country's unemployment rate, saving the taxpayer an estimated \$609 million in federal costs. Put another way, for every \$1 increase in life insurance payouts, US taxpayers may help save \$0.12 in federal "unemployment costs." And, like the savings impact from

³ The socioeconomic effects of the hypothetical 5 percent increase reflects the most current year of the analysis (2016) of life insurance payouts per person.

⁴ See "Our Modeling Approach" for more detail.



\$109 bn

Increase in US
household wealth if
2016 life insurance
payouts hypothetically
increased 5 percent

reducing poverty levels, this estimate does not include additional savings to state-funded unemployment programs.

LIFE INSURANCE PAYOUTS AND HOUSE PRICES

In spite of the Great Recession, owning one's home remains one of the most significant avenues for individuals and households to accumulate wealth. Mortgage payments and the related equity in a home function as a type of “forced saving account.” Holding on to, maintaining, and improving a home can help create wealth for households in the long run—especially low-income households.

In contrast, homes that fall into disrepair or are put up for sale under economic duress can also drive down the value of neighboring properties. So, life insurance payouts can have a positive impact on home prices.

This potential socioeconomic benefit can be expressed in terms of “additional home value” for the average home unit in the US (not simply the direct recipients of life insurance payouts). We calculate that across the US, the increase in house prices associated with a hypothetical five percent increase in payouts in 2016 would have caused a \$109 billion increase in household wealth. In other words, a \$1 permanent increase in life insurance payouts would generate an estimated \$22 of additional value to the US housing market.

1. INTRODUCTION

Societies dating all the way back to the ancient Romans have provided forms of life insurance. In the US, historic trends indicate that about 70 percent of American households (87 million households) currently own life insurance.

Ownership of life insurance is significant across all income levels, including those who likely need it most. Forty-three percent of households with income less than \$35,000, and 66 percent of those with household incomes between \$35,000 and \$50,000, own life insurance. For these households, on average, the ratio of their life insurance coverage level to household income ranges from 2.5 to 3.3 across all income bands.⁵ This life insurance coverage is generally *individual insurance* (a policy underwritten for a specific policyholder) or *group insurance* (a policy for employees of a company, or members of a union or professional association).

The insurance market has experienced a significant transition over the last 15 years. The face value of in-force policies—i.e., insurance policies whose premiums are paid up and are active at a given point in time—almost doubled, from a total of \$17 trillion in 2001 up to \$32 trillion in 2016⁶ (Fig. 1). Of that \$32 trillion, 63 percent represented individual policies and 37 percent represented group policies.

5 LIMRA. (2016). Life Insurance Ownership in Focus: U.S. Household Trends – 2016.

6 ACLI. (2017). 2017 Life Insurers Fact Book. Tables 10.3 and 7.9.

FIG. 1. Total face value of in-force US life insurance policies (\$ million)

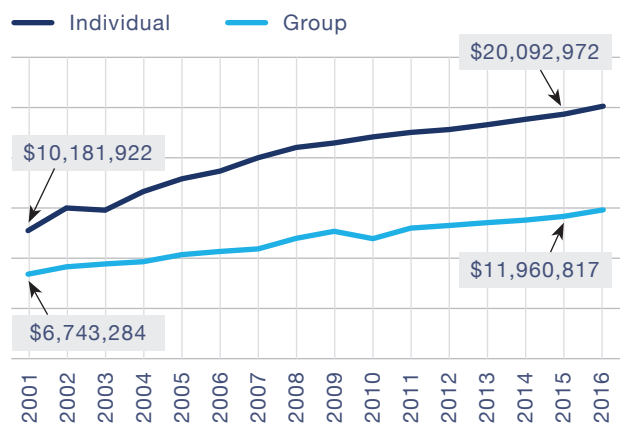
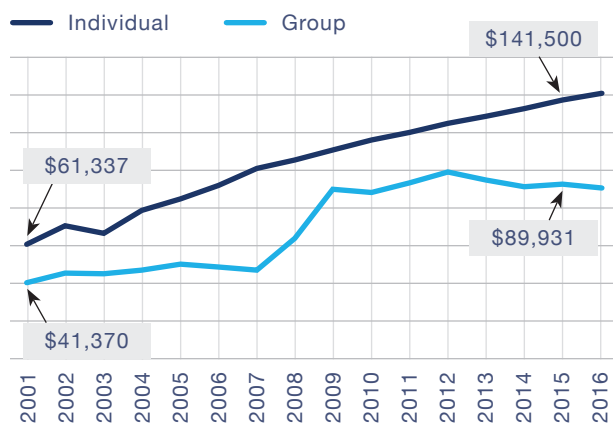


FIG. 2. Average face value of US in-force policies



Although the number of new policies purchased annually during this period decreased by 31 percent, the face amount of insurance purchased remained relatively flat. The average size of the new policies increased from \$114,000 to \$153,000 for individuals and \$45,000 to \$75,000 for group. As a result, the average size of the in-force policies increased during this period to \$142,000 for individuals and \$90,000 for groups in 2016—see Fig. 2.

Since payouts are driven by the face value of in-force individual and group policies, the total annual amount paid out to beneficiaries more than doubled between 2001 and 2016, from \$48 billion to \$100 billion.⁷

1.1 WHY EVALUATE THE SOCIOECONOMIC EFFECTS OF LIFE INSURANCE?

The role of life insurance as a financial safety net to individual beneficiaries is well-recognized. Additionally, studies have evaluated the broader macroeconomic role the life insurance sector plays in boosting the wider economy, for example, by stabilizing markets and spurring economic growth through institutional investment.

Studies such as Beck and Webb (2003), Ward and Zurbruegg (2000), Arena (2006), and Impavido and Musalem (2000) have quantified the economic role of insurance (life and non-life) in the promotion of a country's overall economic growth. These indicate a strong statistical relationship, especially in high-income and/or developed countries:⁸

Studies testing the causal relationship have found evidence that insurance market development is a supply-leading phenomenon. While the number of studies carried out to date is limited, being greatly constrained by the lack of available insurance data, the few existing studies present a number of strong arguments, backed up by rigorous and methodological data analysis, advancing the conclusion that insurance is an agent, and not just a by-product, of [economic] growth.⁹

7 ACLI. (2017). 2017 Life Insurers Fact Book. Table 10.5. Represents direct gross payouts in the 50 states, including amounts that are reinsured.

8 Beck, Thorsten; Webb, Ian. (2003). Economic, Demographic, and Institutional Determinants of Life Insurance Consumption across countries. Washington, DC: World Bank. <https://openknowledge.worldbank.org/handle/10986/17169>

Ward, Damian, and Ralf Zurbruegg. (2000). Does Insurance Promote Economic Growth? Evidence from OECD Countries. *The Journal of Risk and Insurance*, 67(4), 489–506.

Arena, M. (2006). Does Insurance Market Activity Promote Economic Growth? A Cross-Country Study for Industrialized and Developing Countries, World Bank Policy Research Working Paper 4098.

Impavido, Gregorio and Musalem, Alberto R. (2000). Contractual Savings, Stock, and Asset Markets. World Bank Policy Research Working Paper No. 2490. Available at SSRN: <https://ssrn.com/abstract=632560>

9 USAID. Assessment of How Strengthening the Insurance Industry in Developing Countries Contributes to Economic Growth. Report produced by Chemonics International Inc and the International Insurance Foundation. February 15, 2006.

However, deeper knowledge and understanding of the key roles life insurance plays in communities has largely gone unresearched—until now. The econometric analysis in this report, conducted by Oxford Economics and supported by Prudential Financial, adds a new, formalized statistical modeling dimension to this knowledge base. It began with one basic research question:

Do life insurance payouts create societal value?

From this followed other questions: if value is generated, what is the precise nature of life insurance payouts’ interaction with socioeconomic characteristics, and how large is the value of that interaction from the perspective of public savings or value creation across US states?

To answer these questions, our research expands the discussion of life insurance beyond the household and policyholder perspective, into the economic and societal value generated for society as a result of the safety net provided by payouts.

Specifically, the research delves into three socioeconomic channels where analysis has identified causal relationships between life insurance payouts and societal value: by lowering poverty, reducing unemployment, and increasing house prices.

1.2 HOW THIS REPORT IS STRUCTURED

The report is organized into three sections, with each socioeconomic channel evaluated as a unique outcome. In each section, three questions are explored:

- What underpins the relationship?
- What is the magnitude of the relationship?
- How large is the societal benefit across individual states?

However, it is also important to recognize that these specific channels are intertwined. For example, there is an obvious connection between poverty and unemployment: as unemployment decreases, household earnings increase, so poverty declines.

Formulating and testing effective hypotheses that would unpick these connections and relationships involved an iterative process of research, data gathering, evaluation and statistical testing, followed by more research, model specification and development, robustness checks and result interpretation. The following box provides a high-level view of the process flow.

OUR MODELING APPROACH

To explore the relationship between life insurance payouts and socioeconomic variables such as poverty levels, unemployment rates, and house prices, we first explored the theoretical underpinnings of each variable in previous academic research. For example, to explain changes in unemployment, we reviewed studies such as Rios (2014)* and Fortin and Symons (2001)** to identify a clear set of consistent explanatory variables to incorporate into the model. In the Rios study, education and real GDP growth were identified as key explanatory variables for unemployment. To these we added a new explanatory variable—life insurance payout—to identify whether any discernible relationship existed.

The process started with a number of initial hypotheses, focused on the relationship that might exist between the presence of life insurance and a number of key socioeconomic measurements: unemployment; poverty; house prices; new business formation; violent crime; property crime; and education.

At this stage, we did not limit the type of life insurance measure, and tested statistical relationships pertaining to three different measures: life insurance payouts; number of life insurance policies in force; and face value of life insurance in force.

The dataset for socioeconomic variables and insurance variables covered a 16-year period for each US state. Initial correlation tests indicated potential for strong relationships, and additional specification tests were performed (as well as guided by the literature). The models specified were either “System Generalized Method of Moments” (SGMM), or “Least Squares Dummy Variable Corrected” (LSDVC). Model outputs were then contextualized across each US state.

Model results indicated statistically significant relationships. Robustness checks supported the findings for three socioeconomic outcome variables: poverty, unemployment, and house prices. Granger causality modeling also reinforced findings that support a causal relationship.

1	Identify key socioeconomic variables to test
2	Prudential and industry data collection
3	Literature review and secondary data collection
4	Correlation testing and model specification
5	Model development
6	Robustness checks
7	Coefficient interpretation
8	Conversion of coefficient to dollars and state-level estimates

* Rios, Vicente. (2014). What Drives Regional Unemployment Disparities in European Regions? A Space-Time Econometric Modeling Approach. International Conference on Regional Science.

** Fortin P., Keil M., Symons J. (2001). The Sources of Unemployment in Canada, 1967-91: Evidence from a Panel of Regions and Demographic Groups. Oxford Economic Papers, 53(1), 67-93.

2. POVERTY AND LIFE INSURANCE PAYOUTS

The first of the three outcome variables identified by our statistical analysis as having a predictive causal relationship with life insurance payouts is poverty.



12.7 percent of Americans in poverty



Cost \$16,109 per person—on average—in 2016

LIFE INSURANCE PAYOUTS



Reduces poverty and saves taxpayer money



Every \$1 increase in life insurance payouts saves federal taxpayers \$0.35

The US Census Bureau estimated that in 2016, more than 40.6 million people lived below the poverty line in the US—despite several years of consecutive economic growth. This represents more than 12.7 percent of Americans, and an average federal cost of \$16,109 per person in social welfare spending in 2016.¹⁰ The implication of economic growth, coupled with high poverty rates generally indicates growing income inequality—a cause for concern. Although this research does not explicitly address income inequality, the findings provide key insight into the role that life insurance payouts play in helping to reduce poverty—thereby reducing the level of income inequality.

2.1 WHAT UNDERPINS THE RELATIONSHIP TO POVERTY?

A number of real-world scenarios describe the relationship between life insurance and poverty. For example, beneficiaries can maintain income levels during a period of financial or personal difficulty that might arise from death. Alternatively, the passing of a primary income earner, coupled with immediate funerary expenses, may cause extreme financial strain. This is especially the case when the majority of Americans (about 60 percent) lack emergency savings to cover a \$1,000 expense, while the average cost of a funeral is close to \$7,200.¹¹

Empirical evidence provided by Bernheim et al established a connection between insurance coverage and the instance of poverty among surviving spouses. Specifically, life insurance keeps 2.5 percent of surviving wives and 0.1 percent of surviving husbands above the poverty line.¹²

10 Calculated from U.S. Government Publishing Office, Budget of the United States Government. Historic Tables.

11 Bankrate survey. (2017). Conducted by Princeton Survey Research Associates International. <http://www.bankrate.com/finance/consumer-index/money-pulse-0117.aspx> Accessed: 12-11-2017
National Funeral Directors Association. (2015). Member General Price List Survey. <http://www.nfda.org/news/media-center/nfda-news-releases/id/840/nfda-releases-results-of-2015-member-general-price-list-survey> Accessed: 12-11-2017

12 Bernheim et. al. (2003). Are Life Insurance Holdings Related to Financial Vulnerabilities? Economic Inquiry, 41(4), 531-554.

2.2 WHAT IS THE MAGNITUDE OF THE RELATIONSHIP AND SOCIETAL BENEFIT?

The magnitude of the relationship between life insurance payouts and poverty appears small—at least initially. According to our model, a five percent hypothetical increase in the average life insurance payout per person (i.e., the total number of payouts divided by the total US population) would reduce the poverty rate by 0.033 percentage points. Fig. 3 provides an illustration of this relationship, based on the 2016 national poverty estimate of 12.7 percent.

While this is a seemingly low-magnitude relationship, when multiplied across the millions of people living in poverty in the US, the implications become more meaningful. Not least are the taxpayer savings associated with federal programs to support those in poverty.

The 0.033 percentage point hypothetical decrease in poverty in the above example **equates to about 108,100 people being lifted out of poverty**, or being prevented from entering into poverty, as a result of the five percent increase in payouts per person.

At an average federal per-person poverty cost of \$16,100¹³ in 2016—about the cost of a basic Nissan Sentra—the **savings to US taxpayers would exceed \$1.7 billion**. This is roughly equivalent to the amount the US government spent on career, technical and adult education programs in 2016.¹⁴

Put another way, for every \$1 increase in payouts, US taxpayers save \$0.35 in costs associated with federal spending on welfare payments.

FIG. 3. Relationship between life insurance payouts and poverty per person (pp)



13 Includes low income/welfare programs such as SNAP, TANF, Head Start, Child Nutrition Programs and Medicaid.

14 US Department of Education. Fiscal Year 2017 Budget Summary and Background Information. Accessed at: <https://www2.ed.gov/about/overview/budget/budget17/summary/17summary.pdf>

3. UNEMPLOYMENT AND LIFE INSURANCE PAYOUTS

The second of the three variables identified by our statistical analysis as having a predictive causal relationship with life insurance payouts is unemployment. At first, this might seem a curious finding: why would an increase in life insurance payouts reduce unemployment?



7.7 million people unemployed—on average—in 2016



U.S. government spent approximately \$31.2 billion on unemployment compensation and support programs

LIFE INSURANCE PAYOUTS



Contribute to reductions in unemployment and save federal dollars



For every \$1 increase in life insurance payouts, taxpayers save \$0.12

3.1 WHAT UNDERPINS THE RELATIONSHIP TO UNEMPLOYMENT?

The deaths of individuals who are employed—especially those employed in managerial or other key roles within a firm—create challenges to businesses and may have negative economic consequences. This is particularly the case in small businesses, which provided more than 41.4 million jobs in the US in 2015.¹⁵ These businesses are often more reliant on key individuals than larger firms, and therefore are more susceptible to economic hardships and disruption of normal operations in the event of a key worker passing away.

Life insurance coverage, such as key person life insurance coverage, may also serve to boost business growth. By safeguarding against uncertainty, life insurance can serve as a “springboard” to expansion that might in normal circumstances appear too risky—although any such expansion is generally the result of having the safety net of an insurance policy in place, rather than of an actual death benefit payment.¹⁶

3.2 WHAT IS THE MAGNITUDE OF THE RELATIONSHIP AND SOCIETAL BENEFIT?

Our econometric modeling demonstrates an inverse relationship between life insurance payouts and unemployment. This means that any increase in life insurance payouts could help decrease the level of unemployment.

15 US Small Business Administration Office of Advocacy, based on data provided by the U.S. Census Bureau, Statistics of U.S. Businesses. Small businesses here are those that employ between 1 and 99 jobs.

16 “Often small business owners in the region would see an opportunity to expand but would hesitate. A loss could not only cripple the expansion project but threaten the existing stable business because reserves had been spent on the expansion. Projects were abandoned because of uncertainty. This highlighted the benefit of insurance as a “spring board.” Because insurance can decrease uncertainty and serve as a backstop, it can allow business to thrive, encourage investment and bring jobs and growth to a local economy”. Olson, David. (2016). Insurance as a Social Good. Wisconsin School of Business. <https://bus.wisc.edu/knowledge-expertise/academic-departments/risk-and-insurance/news/2016/11/07/janice-abraham> Accessed: 11/8/2017

Our model predicts that if life insurance payouts were hypothetically increased by five percent in a given year, unemployment would decrease by 0.084 percentage points. This means, as shown in Fig. 4, that if the average payout increased from \$310 to \$325.50 per person across the entire US population, then the average unemployment rate would fall from a hypothetical 6.0 percent to about 5.92 percent.¹⁷

FIG. 4. Relationship between life insurance payouts and unemployment



The implications of such a decrease in the US unemployment rate are striking. A number of government unemployment programs are designed to help families and individuals back into the job market—whether through unemployment insurance payments, education, or other support programs. Reductions in unemployment mean less spending for these programs.

The average spending per unemployed person was about \$4,500 in 2016. A 0.084 percentage point drop in the unemployment rate, as in the above example, represents **approximately 134,200 people moving from unemployed to employed—and thus a saving of almost \$609 million in federal unemployment spending.** This saving is roughly equal to federal grant spending on highway traffic safety in 2016.

Stated differently, every \$1 increase in life insurance payouts may help save federal taxpayers about \$0.12 in costs associated with federal unemployment programs.

¹⁷ Per person payout is based on total life insurance payouts divided by total US population.

4. HOUSE PRICES AND LIFE INSURANCE PAYOUTS

The socioeconomic benefits of life insurance payouts are not restricted to savings to federal government and taxpayers. The benefits also extend to all homeowners—not merely those who receive life insurance payouts—by buoying house price values and the associated increase in homeowners’ wealth.



Death of uninsured primary income earner risks home foreclosure



Home can fall into disrepair, or listing can saturate the market, driving down values of neighboring homes

LIFE INSURANCE PAYOUTS



Allow survivors to stay in place, or take time to adjust living situations—not selling under financial duress



Driving up home values for all homeowners



For every \$1 in life insurance payouts, the sum of all national home values increases approximately \$22

In spite of the Great Recession, owning one’s home remains one of the most significant avenues to accumulate wealth for individuals and households—through a combination of building equity and any appreciation in the value of the home, as opposed to paying rent to a landlord. As stated by Brett Theodos, a senior research associate at the Urban Institute, “It is a forced saving mechanism, and if you don’t have to think about saving, it goes better.”

In the third quarter of 2017, the US home ownership rate was 63.9 percent.¹⁸ As such, any gains in home values attributable to life insurance payouts generate further returns to wealth accumulation for almost two-thirds of US households.

4.1 WHAT UNDERPINS THE RELATIONSHIP TO HOUSE PRICES?

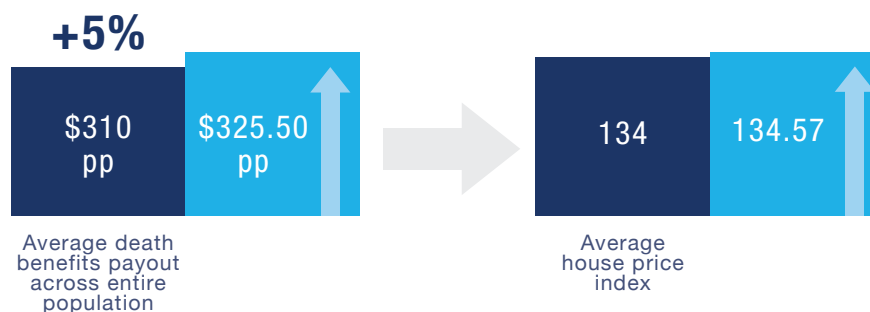
The relationship between home prices and life insurance is fairly straightforward. Life insurance payouts—especially in the event of a primary income earner’s death—can enable surviving homeowners to maintain their homes, and if necessary, take their time before making lifestyle and housing adjustments, rather than selling their homes quickly under economic duress, or being forced into foreclosure. This outcome boosts both home and neighborhood desirability, since houses in well-kept neighborhoods generally demand higher prices, and also reduces the availability of housing stock in the US—thereby further boosting house prices.

¹⁸ U.S. Census Bureau. Current Population Survey/Housing Vacancy Survey, Series H-111.

4.2 WHAT IS THE MAGNITUDE OF THE RELATIONSHIP AND SOCIETAL BENEFIT?

The magnitude of the relationship between life insurance payouts and home prices is significant. Based on our econometric model, a hypothetical, permanent five percent increase in payouts drives up the national house price index (HPI) by 0.567 points (Fig. 5).¹⁹ When applied to the average home price in the US, this represents an increase in the value of every home unit of about \$800.

FIG. 5. Relationship between life insurance payouts and house prices



In 2016, the US had approximately 135.7 million housing units. An \$800 boost to all housing units therefore equates to **\$109 billion in added value to all US homeowners**²⁰—equivalent to Mississippi's 2016 gross domestic product (GDP).

Another way to state this is that, for every \$1 permanent increase in payouts, the sum of all national home values goes up \$22.

¹⁹ The HPI, produced by the Federal Housing and Finance Agency, is a broad measure of the movement of single-family house prices. The HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or refinancings on the same properties. Information is obtained by reviewing repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac since January 1975. The HPI serves as a timely, accurate indicator of house price trends at various geographic levels.

²⁰ Home value is generally not recognized until a home is sold. However, as a measure of wealth, increases in home values increase equity for homeowners.

5. CONCLUSION

The results of our econometric modelling show that an increase in life insurance payouts can be expected to result in benefits to society above and beyond the benefits realized by the direct beneficiaries of the payouts.

Therefore, what is the socioeconomic impact of all payouts, that is, the \$100 billion in life insurance payouts in 2016? While our methodology applies to incremental increases and does not extend to the impact of total payouts, we can extrapolate the impact of the incremental 5 percent, and estimate that the impact of all payouts would be approximately \$47 billion for Federal poverty and unemployment spending programs in 2016.²¹

Our research provides strong quantitative and statistical evidence of the socioeconomic importance of life insurance and payouts in the US. From a policy perspective, encouraging life insurance coverage—and, subsequently, higher life insurance payouts overall—would provide an avenue for future public savings in poverty and unemployment spending.

As the US continues running a budget deficit, market-driven activities that reduce public costs can help pave a way towards balanced budgets. Furthermore, the results of our modeling only calculate savings at the federal level. State-level public savings associated with reductions in poverty and unemployment would also occur, further boosting the socioeconomic value of life insurance payouts.

Additionally, the wealth effects associated with payouts and home prices provide compelling evidence of the social value of life insurance. Homeowners benefit from life insurance payouts, regardless of whether they are the direct recipient of a payout.

This research provides a key first step in furthering our knowledge and understanding of the statistical relationships that exist between life insurance payouts and key social outcomes—a topic not explicitly explored in previous industry and academic research. The statistical relevance and causal relationships encourage further research into, and analysis of, how life insurance payouts connect with community and social outcomes in order to extend the literature on this topic.

²¹ The relationship between life insurance payouts, poverty and unemployment is non-linear. However, absent historic data on large incremental shifts in life insurance payouts, we extrapolated marginal effects in payout changes to contextualize a total payout effect.

APPENDIX 1 – DATA SOURCES

Data sources used to develop the model and final results are as follows:

- Life insurance payouts: ACLI – Tabulations of National Associations of Insurance Commissioners
- Unemployment rate: Bureau of Labor Statistics (BLS) – Local Area Unemployment Statistics
- Gross Domestic Product: Bureau of Economic Analysis (BEA)
- Unemployment benefits: BEA – National Income and Product Accounts (NIPA)
- New Business Formation: BEA – Business Dynamic Statistics
- Foreign Direct Investment: BEA – NIPA
- Disability: US Census – American Community Survey (ACS)
- Real Wage: BEA – Regional Accounts
- Education: US Census – ACS
- Poverty level: US Census – Small Area Income and Poverty Estimates
- House Price: Federal Housing Finance Agency – House Price Index
- House units: US Census – Population and Housing Estimates
- Median home value: Zillow Home Value Index (by state)
- Population: US Census – Population and Housing Estimates
- Unemployment spending: US Government Publishing Office – Budget of the United State Government, Historical Tables
- Welfare spending: Budget of the United State Government, Historical Tables (Table 3.2 Outlays by Function and Subfunction); Universal Services Monitoring Report (Table 2.2);
- GDP Deflator: U.S. Bureau of Economic Analysis, Gross Domestic Product: Implicit Price Deflator [GDPDEF], retrieved from FRED, Federal Reserve Bank of St. Louis

APPENDIX 2 - CAUSALITY

A NOTE ON CAUSALITY

Regression techniques usually establish association between two or more variables. Establishing the existence of any causal relationship between variables based on a statistical association requires a theoretical foundation to explain the links between the variables and further econometric tests.

During this research, we began each section by identifying theoretical underpinnings for the associations found within the modeling. However, an established statistical association does not, by itself, check for the direction of causality. For example, it will not establish whether it is insurance which is causing poverty, or vice versa. For this reason, in the econometric modeling, we ensure that we test for two-way causality. The Generalized Method of Moments (GMM) method ensures that the estimated statistical association measures the effect of insurance on the outcome variable, and not vice versa.

A statistical association may also occur because of some common, unrelated trend, rather than a causal relationship. To address this, we used the Granger causality test and lags in the GMM approach to ensure the associations we estimated were not spurious.

The size of the association between insurance payouts and the outcome variables is also affected by how comprehensive the econometric model is. For instance, it is well established that wage rate is an important factor in determining unemployment. If we omit wage rate from the econometric model, it is likely that the effect of insurance payouts on unemployment may be over-estimated. In addition to ensuring our econometric models were as comprehensive as possible, the GMM technique uses lag of the variables to mitigate any possible bias in the magnitude of the coefficients as a result of omitted variables.

Thanks to the above considerations, we have confidence that all associations estimated by our econometric model represent causal relationships between life insurance payouts and the outcome variables—poverty levels, unemployment rates, and house prices.

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